

What is claimed is:

1. A method of identifying a T cell receptor (TCR) variable (V) gene expressed by target T cells in an individual, comprising:

- 5           a) determining expression of one or more TCR V genes by activated T cells from said individual; and  
          b) determining regulatory activity elicited in response to one or more TCR V peptides by T cells from said individual;

10           wherein a TCR V gene that is preferentially expressed in step a), whose corresponding TCR V peptide elicits low T cell regulatory activity in step b), is identified as a V gene expressed by target T cells.

15           2. The method of claim 1, wherein said individual has an autoimmune disease.

          3. The method of claim 2, wherein said autoimmune disease is multiple sclerosis.

20           4. The method of claim 1, wherein expression of said one or more TCR V genes is determined by the polymerase chain reaction (PCR).

          5. The method of claim 1, wherein said one or more TCR V genes are V beta genes.

25           6. The method of claim 1, wherein said activated T cells are characterized as CD25+CD4+ T cells.

          7. The method of claim 6, wherein said activated T cells are further characterized as CD45RO+ or CD45RA- T cells.

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5            9. The method of claim 1, wherein said  
regulatory activity is secretion of an anti-inflammatory  
cytokine.

10            11. The method of claim 9, wherein secretion  
of said cytokine is determined by an immunospot assay.

13. The method of claim 1, wherein said one or  
15 more TCR V peptides are CDR2 peptides.

14. The method of ~~claim 1~~, wherein said low regulatory T cell activity in step b) is indicated by at least a 50% reduction in regulatory activity compared to a normal value.

a) identifying a TCR V gene expressed by target T cells in an individual with an autoimmune disease by the method of claim 1; and

b) ~~determining~~ determining T cell regulatory activity elicited in response to the corresponding TCR V peptide after initiation of therapy.

17. The method of claim 15, wherein said therapy selectively targets said T cells that express said TCR V gene.

19. A method of monitoring the efficacy of a therapy for an autoimmune disease, comprising:

20. The method of claim 19, wherein said autoimmune disease is multiple sclerosis.

22. The method of claim 21, wherein said  
5 therapy is immunization with a peptide corresponding to  
said TCR V gene.

a) identifying a TCR V gene expressed by target  
10 T cells in an individual with an autoimmune disease by  
the method of claim 1; and  
b) selecting a therapy that targets T cells  
expressing said TCR V gene.

25. The method of claim 21, wherein said therapy is immunization with a peptide corresponding to said TCR V gene.

wherein said kit components are suitable for use in the method of claim 1.

25                    27. The kit of claim 26, wherein said one or  
more TCR V peptides are V beta peptides.

29. The kit of ~~claim 26~~, wherein said one or  
more agents for detecting TCR V gene expression are PCR  
5 primers.

10                    31. The kit of claim 26, comprising at least 3  
TCR V peptides and at least 3 agents for detecting TCR V  
gene expression.

32. The kit of claim 31, comprising at least  
20 TCR V peptides and at least 20 agents for detecting  
15 TCR V gene expression.